Massachusetts Department of ENVIRONMENTAL PROTECTION

f a c t s h e e t

Summary of Massachusetts Drinking Water Program Testing Requirements for Public Water Systems

December 2003

This fact sheet summarizes drinking water testing requirements maximum contaminant levels (MCLs) and Maximum Residual Disinfectant Levels (MRDLs) in the State of Massachusetts. These MCLs/MRDLs, or drinking water standards, have been established by the U.S. Environmental Protection Agency or the State of Massachusetts for the protection of the public health.

These requirements apply to all *public water systems* in the state - systems serving drinking water to at least 25 individuals (or 15 service connections) at least 60 days of the year. There are two types of public water systems:

- ***Community Water Systems*** - primarily serve year-round residents; and
- ***Non-Community Systems*** - serve water to non-residential customers and may include restaurants, factories, schools and hospitals.

Non-community systems that regularly serve at least 25 of the same people, for approximately four or more hours a day, four or more days per week, for more than six months or 180 days of the year are called ***Non-Transient Non-Community Water Systems*** (NTNCs) and are regulated more stringently than ***Transient Non-Community Water Systems*** (TNCs).

The standards listed apply to water, which is delivered to the user's tap. Most samples are collected from the point of entry to the distribution system (after any treatment); however, some measurements including those for disinfectants, some disinfection byproducts (trihalomethanes and haloacetic acids), bacteria, lead and copper are conducted out in the distribution system. For lead and copper, the MCL has been replaced with an "action level" and is measured at the consumer's tap.

Determining compliance with these standards differs with each contaminant. The regulations and the individual system's approved sampling plan must be consulted for more specific information. In certain cases, DEP may require more frequent testing than specified.

DEP also utilizes health-based guidance numbers for chemicals for which standards have not been established. These are determined by the DEP Office of Research and Standards and applied on a case-by-case basis. The list of guidance values is updated periodically.

Also included is a list of the federal secondary contaminant levels. These are not enforceable but can be used to determine aesthetic quality.

Updated copies of the Massachusetts Drinking Water Regulations, 310 CMR 22.00, are available at the State Bookstores in Boston 617-727-2834 and Springfield 413-784-1376, DEP Drinking Water Program 617-292-5770, or on the web at http://www.mass.gov/dep/water/laws/regulati.htm .

Inorganic Compounds

Parameter	MCL	Monitoring Requirements
Antimony	0.006 mg/l	Monitoring frequency depends on DEP-approved sampling plan. Community and non-transient non-community water supply sources monitoring frequency ranges from once per year for surface water sources to once every three years for groundwater sources. Non-vulnerable sources may be granted waivers and sample once every nine years.
Arsenic[1]	0.05 mg/l	
Asbestos[2]	7 million fibers/l	
Barium	2 mg/l	
Beryllium	0.004 mg/l	
Cadmium	0.005 mg/l	
Chromium	0.1 mg/l	
Cyanide	0.2 mg/l	
Fluoride[3]	4.0 mg/l	
Lead (action level)	0.015 mg/l	
Copper (action level)	1.3 mg/l	
Mercury	0.002 mg/l	
Nickel	Reserved (Under review)	
Nitrate (as N)[4]	10 mg/l	
Nitrite (as N)[4]	1 mg/l	
Total Nitrate & Nitrite (as N)	10 mg/l	
Selenium	0.05 mg/l	
Thallium	0.002 mg/l	

[1] The MCL for Arsenic will drop to 0.010 mg/l effective January 23, 2006.

[2] Statewide waivers have been approved by the U.S. EPA for source waters.

[3] There is also a secondary MCL for fluoride which is 2.0 mg/l.

[4] Transient Non-Community systems (TNC) are required to monitor for these contaminants.

Volatile Organic Compounds

Parameter	MCL	Monitoring Requirements
Benzene	0.005 mg/l	Monitoring frequency depends on DEP–approved sampling plan. Community and non-transient non-community water supply sources must initially monitor for four consecutive quarters every three years. Waivers may be granted to non-vulnerable sources to monitor once every three years. Monitoring for the following unregulated VOCs is also required: Methyl tert-Butyl Ether (MTBE)
Carbon tetrachloride	0.005 mg/l	
Dichloromethane	0.005 mg/l	
o-Dichlorobenzene	0.6 mg/l	
para-Dichlorobenzene	0.005 mg/l	
1,2-Dichloroethane	0.005 mg/l	
cis-1,2-Dichloroethylene	0.07 mg/l	
trans-1,2-Dichloroethylene	0.1 mg/l	
1,1-Dichloroethylene	0.007 mg/l	
1,2-Dichloropropane	0.005 mg/l	
Ethylbenzene	0.7 mg/l	
Monochlorobenzene	0.1 mg/l	
Styrene	0.1 mg/l	
Tetrachloroethylene	0.005 mg/l	
Toluene	1 mg/l	
Trichloroethylene	0.005 mg/l	
1,1,1-Trichloroethane	0.2 mg/l	
1,2,4-Trichlorobenzene	0.07 mg/l	
1,1,2-Trichloroethane	0.005 mg/l	
Vinyl Chloride	0.002 mg/l	
Xylenes (total)	10 mg/l	

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Synthetic Organic Compounds

Parameter	MCL	Monitoring Requirements
Alachlor	0.002 mg/l	Monitoring frequency depends on DEP–approved sampling plan. Community and non-transient non-community water supply sources must initially monitor for four consecutive quarters. Non-vulnerable sources may be granted monitoring waivers.
Atrazine	0.003 mg/l	
Benzo(a)pyrene	0.0002 mg/l	
Carbofuran	0.04 mg/l	
Chlordane	0.002 mg/l	
Dalapon	0.2 mg/l	
Di(2-ethylhexyl) adipate	0.4 mg/l	
Di(2-ethylhexyl) phthalate	0.006 mg/l	
Dinoseb	0.007 mg/l	
Diquat[5]	0.02 mg/l	
Dibromochloropropane (DBCP)[6]	0.0002 mg/l	
2,4-D	0.07 mg/l	
Endothall[5]	0.1 mg/l	
Endrin	0.002 mg/l	
Ethylene dibromide (EDB)[6]	0.00002 mg/l	
Glyphosate[5]	0.7 mg/l	
Heptachlor	0.0004 mg/l	
Heptachlor epoxide	0.0002 mg/l	
Hexachlorobenzene	0.001 mg/l	
Hexachlorocyclopentadiene	0.05 mg/l	
Lindane	0.0002 mg/l	
Methoxychlor	0.04 mg/l	
Oxamyl (Vydate)	0.2 mg/l	
Polychlorinated biphenyls (PCBs)	0.0005 mg/l	
Pentachlorophenol	0.001 mg/l	
Picloram	0.5 mg/l	
Simazine	0.004 mg/l	
2,3,7,8-TCDD (Dioxin)[5]	$3x10^{-8}$ mg/l	
Toxaphene	0.003 mg/l	
2,4,5-TP (Silvex)	0.05 mg/l	

[5] Statewide waivers have been approved by the U.S. EPA for both ground and surface waters.

[6] Statewide waivers have been approved by the U.S. EPA for surface waters.

Turbidity

Parameter	MCL	Monitoring Requirements
Turbidity	1 NTU	Applies to Community and Non-community systems using unfiltered surface water sources where filtration has been determined to be required as well as to filtered surface water sources that have not yet met the Surface Water Treatment Rule (310 CMR 22.20A). Monitoring is required daily. Non-community systems may reduce sampling if granted DEP approval to do so.

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Disinfectants/Disinfection Byproducts

Parameter	MRDL	Monitoring Requirements
Chlorine (as Cl_2)	4.0 mg/l	Monitoring frequency depends on DEP–approved sampling plan and type of treatment being used. Applies to Community and non-transient non-community systems which add a chemical disinfectant (oxidant) to the water. [7]Also applies to Transient non-community (TNC) systems.
Chloramines (as Cl_2)	4.0 mg/l	
Chlorine dioxide (as ClO_2)[7]	0.8 mg/l	
Parameter	**MCL**	
Total Trihalomethanes: chloroform bromodichloromethane dibromochloromethane bromoform	0.080 mg/l	
Haloacetic Acids (five): monochloroacetic acid dichloroacetic acid trichloroacetic acid monobromoacetic acid dibromoacetic acid	0.060 mg/l	
Bromate	0.010 mg/l	
Chlorite	1.0 mg/l	

Bacteria

Parameter and MCL	Monitoring Requirements
Coliform Bacteria A) MCL- More than one total coliform-positive sample if collecting 40 or fewer samples per month, or more than 5% positive if collecting more than 40 samples per month. B) Acute MCL - Any E.coli-positive or fecal coliform-positive repeat sample, or any total coliform-positive repeat sample following a fecal coliform-positive or E.coli-positive routine sample.	The number of samples collected depends on the population served (see 310 CMR 22.05, Table 1-22.05). The range is from 1/month for systems serving ≤ 1,000 persons to 480/month for systems serving > 3,960,000. Non-community systems must sample no less than quarterly.

Radionuclides

Parameter	MCL	Monitoring Requirements
Gross Alpha Particle Activity[8]	15 pCi/l	Community systems must monitor for 4 consecutive quarters prior to December 31, 2007. Grandfathering of historic data or no detections during the first two quarters may reduce this requirement. Future monitoring requirements are based on the results of this initial period. [8]Includes radium-226 but excludes radon and uranium. [9]If the gross alpha particle activity is ≤ 5 pCi/l, it may be substituted for the required radium-226 analysis. If the gross alpha particle activity is ≤ 15 pCi/l, it may be substituted for the required uranium analysis. [10]Monitoring is required only at those systems designated by the Department.
Combined Radium-226[9] and Radium-228	5 pCi/l	
Uranium[9]	30 ug/l	
Beta Particle Activity[10]	4 mrem/yr	
Photon Radioactivity[10]	4 mrem/yr	
Average Annual Concentrations which produces a body or organ dose of 4 mrem/yr		
Tritium	20,000 pCi/l	
Strontium-90	8 pCi/l	

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Massachusetts Drinking Water Guidelines

This list of public water supply guidelines are for chemicals that do not have MCLs/MRDLs. DEP's Office of Research and Standards (ORS) derives these guidelines, and adopts or revises U.S. EPA health advisories and proposed MCLs. New guidelines are evaluated on a case-by-case, ongoing basis and may be incorporated into the list at any time.

For information on the derivation of the guidelines, and for general information on the health effects of water contaminants, please contact ORS at 617-292-5570 or visit http://www.mass.gov/dep/toxics/chemical.htm .

Parameter		Guideline (mg/l)
Acetone		3.0
Aldicarb		0.003
Aldicarb sulfone		0.002
Aldicarb sulfoxide		0.004
Bromomethane		0.01
Chloroform[11]		0.005
Dichlorodifluoromethane		1.4
1,1-Dichloroethane		0.07
1,3-Dichloropropene		0.0005
1,4-Dioxane		0.05
Ethylene glycol		14
Methyl ethyl ketone		0.35
Methyl isobutyl ketone		0.35
Methyl tertiary-Butyl Ether		0.07
Metolachlor		0.1
Naphthalene		0.140
Nickel		0.1
Petroleum Hydrocarbons		
TPH		0.2
Aliphatics	C5-C8	0.4
	C9-C12[12]	4.0
	C9-C18[12]	4.0
	C19-C36	40.0
Aromatics	C11-C22	0.2
	C9-C10	0.2
Radon-222[13]		10,000 pCi/l
Sodium[14]		20
Tetrahydrofuran		1.3
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)		210

[11] Non-chlorinated supplies only.

[12] The overlap in the C9-C12 range is the result of the VPH and EPH analytical methods used to quantitate these ranges of petroleum hydrocarbons in drinking water. The choice of the most appropriate range to use is based on the identity of the petroleum product of concern and is therefore determined on a case-specific basis.

[13] EPA has proposed an MCL of 300 pCi/l.

[14] The sodium guideline is based on an 8-ounce serving.

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Massachusetts Secondary Standards

Massachusetts has secondary standards for drinking water. The parameters listed below are not known to cause a health risk but may affect the taste, color, and/or odor of drinking water.

Parameter	Secondary MCL (mg/l)
Aluminum	0.05 to 0.2
Chloride	250
Color	15 color units
Copper	1
Corrosivity	Non-corrosive
Fluoride	2
Foaming agents	0.5
Iron	0.3
Manganese	0.05
Methyl tertiary-Butyl Ether[15]	0.020 – 0.040
Odor	3 threshold odor numbers
pH	6.5 to 8.5
Silver	0.10
Sulfate[16]	250
Total dissolved solids (TDS)	500
Zinc	5

[15]Based on EPA's Drinking Water Advisory using taste and odor thresholds.
[16]EPA has proposed an MCL of 500 mg/l.

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